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Comment on "Metabolic tumor heterogeneity analysis by F-18 FDG PET/CT predicts mediastinal lymph node metastasis in non-small cell lung cancer patients with clinically suspected N2"

ABSTRACT

With great interest, we read the article "metabolic tumor heterogeneity analysis by F-18 FDG PET/CT predicts mediastinal lymph node metastasis in non-small cell lung cancer patients with clinically suspected N2"(by Kisoo Pahk et al., 2018). And we would like to thank the authors for this highly useful work, which raises a few points worthy of discussion.

With great interest, we read the article "metabolic tumor heterogeneity analysis by F-18 FDG PET/CT predicts mediastinal lymph node metastasis in non-small cell lung cancer patients with clinically suspected N2"(by Kisoo Pahk et al., 2018) [1]. In the present article, the authors [1] developed a multivariate regression prediction model to evaluate the usefulness of metabolic heterogeneity assessed by the PET combined with CT using F-18 fluorodeoxyglucose in primary non-small cell lung cancer patients with clinically suspected N2 metastasis in predicting pathological mediastinal lymph node metastasis.Model predictors included [1] age, sex, T stage,cell type, SUVmax, MTV and COV.Multivariate analysis showed that metabolic heterogeneity defined as COV(RR:15) showed the superior predictability of the mediastinal metastasis(sample size = 50, events = 23,events per variable [EPV] = 3.3). These results are encouraging.However,a potential problem arising from a too-small ratio of EPV can affect the precision and accuracy of models' regression coefficients [2]. If the model is overly complex compared to the nature of the problem, the actual performance of the model might deteriorate [3]. A well-known problem is that the resulting models may not validate well for new subjects [4]. Ten EPV is a widely advocated minimal criterion for sample size considerations in logistic regression analysis.

As Pencina et al. point out [5], the critical statistical aspects of any risk assessment tool are discrimination and calibration.Calibration is typically assessed by reviewing the plot of predicted probabilities from the model versus the actual probabilities [2]. We therefore recommend that Kisoo Pahk and co-workers examined the model calibration using the Hosmer-Lemeshow goodness-of-fit test(R software,Frank harrell's rms packages). And the multivariate regression prediction model as constructed by Kisoo Pahk et al should be external validation. We would like to thank Kisoo Pahk and co-workers for this highly interesting work.

Conflict of interest

None.

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Jinshan Zhang*

Department of Nuclear Medicine and Radiation Oncology, The Third Affiliated Hospital of Guangzhou Medical University, Guangzhou, 510150, Guangdong Province, People's Republic of China
E-mail address: zhangjsgy3y@gzhmu.edu.cn.

Ge Wen

Department of Nuclear Medicine and Radiation Oncology, The Third Affiliated Hospital of Guangzhou Medical University, Guangzhou, 510150, Guangdong Province, People's Republic of China
E-mail address: wenge@gzhmu.edu.cn.

Yuan Li

Department of Nuclear Medicine and Radiation Oncology, The Third Affiliated Hospital of Guangzhou Medical University, Guangzhou, 510150, Guangdong Province, People's Republic of China
E-mail address: liyuan8142003@163.com.

Kaixiang Zhong

The Third Clinical School of Guangzhou Medical University, Guangzhou, 510150, Guangdong Province, People's Republic of China
E-mail address: tongtongonggz@163.com.

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* Corresponding author.